



# Abstracts

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# Horse chestnut (*Aesculus hippocastanum* L.) seed phenolic extracts obtained by ultrasound-assisted extraction

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Horse chestnut (*Aesculus hippocastanum* L.) is a deciduous tree widely cultivated in urban areas with temperate climate across the Northern hemisphere. This species is known mainly for the steroidal glycosides resulting from the secondary metabolism, among which aescin is the main active component and responsible for most of its medicinal properties<sup>[1,2]</sup>. While the bark of this tree has been used to treat dermatitis, the leaves and seeds are used due to their anti-inflammatory effects<sup>[2]</sup>. In fact, horse chestnut seed is an important raw material in the pharmaceutical industry. On the other hand, bioactive phenolic compounds such as quercetin and kaempferol glycosides can also be found in this raw material<sup>[3]</sup>. Therefore, this study was carried out to characterize the phenolic composition of the horse chestnut seed kernel, shell, and coat. The different parts of the seed were hand-separated with a knife, lyophilized, and ground to a fine powder. Hydroethanolic extracts were then obtained by ultrasound-assisted extraction, using 20% ethanol and 40 min sonication at 400 W (20 kHz frequency). The phenolic profiles were characterized by high-performance liquid chromatography coupled with diode array detector and electrospray ionization tandem mass spectrometry (HPLC-DAD-ESI/MS<sup>n</sup>). The seed kernel was particularly rich in flavonoids, among which kaempferol-*O*-pentoside-*O*-hexoside-*O*-hexoside and isorhamnetin-*O*-pentoside-*O*-di-hexoside were predominant compounds. The coat extract contained mostly flavan-3-ols ( $\beta$ -type (epi)catechin derivatives). The shell also contained flavan-3-ols and flavonoids, where (-)-epicatechin and kaempferol-*O*-di-deoxyhexoside were the phenolic compounds with the highest abundance in each group, respectively. In general, the coat was the seed part with the highest content of phenolic compounds, followed by the kernel. Thus, this study showed that the different parts of the inedible horse chestnut seed have different phenolic profiles in qualitative and quantitative terms. Further analyses to assess the *in vitro* antioxidant, anti-inflammatory, antimicrobial, and cytotoxic activities of the obtained seed extracts are underway.

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1. Wilkinson J.A, Brown A.M.G, International Journal of Cosmetic Science, 1999, 21, 437.
2. Foca G, et al. Nuts and Seeds in Health and Disease Prevention. Preedy V, Watson R (Eds.), Academic Press, 2011, 653.
3. Kapusta I, et al. Journal of Agricultural and Food Chemistry, 2007, 55, 8485.